

## **ABSTRACT**

A power coupling device for coupling power to a rotating member includes a primary magnetic core defining a first recess, and a secondary magnetic core defining a second recess and disposed adjacent the primary magnetic core. The primary and secondary cores are arranged so as to form an air gap therebetween. The air gap permits relative rotation of the cores about a common axis of rotation. A primary conductive winding is disposed within the first recess, and a secondary conductive winding is disposed within the second recess. At least one of the primary and secondary windings is a fractional turn winding, thereby enabling the transfer of power between multiple input and output voltages. Shielding is provided by a pair of continuous, circular, semi-toroidal shells arranged to support the currents needed to cancel the fields from the transformer.